IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Applicant(s): E. Sadot et al.
Case: 501022-A-01-US (Sadot)
Serial No.: 09/915,609
Filing Date: July 26, 2001
Group: 2143
Examiner: Kyung H. Shin

Title: Secret Session Supporting Load Balancer

REPLY BRIEF

Commissioner for Patents
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Sir:

The remarks which follow are submitted in response to the Examiner's Answer dated December 6, 2006 in the above-identified application. The arguments presented by Appellants in the corresponding Appeal Brief are hereby incorporated by reference herein.

In the Answer at pages 16-22, the Examiner responds to various arguments raised by Appellants in the Appeal Brief with regard to the §103(a) rejection of claims 1-5, 7-12 and 14-22 over U.S. Patent No. 6,772,333 (hereinafter "Brendel") in view of U.S. Patent No. 5,774,668 (hereinafter "Choquier") and in further view of U.S. Patent No. 6,138,120 (hereinafter "Gongwer"). The Examiner organizes his response regarding this rejection into Points A.1 through A.7, which Appellants will address individually below.

Point A.1

The Examiner argues that Brendel does not teach away from the present invention. Appellants respectfully disagree. As Appellants noted in their Appeal Brief at page 4, last

paragraph, conventional load balancers ensure SSL persistency by simply storing session IDs with respective server identifiers. This is problematic because the resulting stored lists require large amounts of memory, and processing such lists negatively impacts performance. See the background portion of the present specification at page 1, line 19, to page 2, line 8, and page 2, lines 13-32. The present invention as set forth in claim 1 overcomes this significant problem of the prior art by configuring the load balancer with information specifying a pre-assignment of different groups of session ID values to respective ones of the servers, configuring the servers to assign session ID values from their respective pre-assigned groups to sessions handled by those servers, and configuring the load balancer to select servers to receive client messages based on the pre-assigned groups of session ID values and the session ID values of the client requests. This advantageously allows the load balancer to maintain SSL persistency using less storage and processing overhead than would be required using the conventional approach.

The Brendel reference teaches away from the claimed invention because it teaches to ensure SSL persistency by storing session IDs with respective server identifiers, just like the above-noted conventional load balancers described by Appellants in the background portion of their specification. As Appellants noted at page 5, first paragraph, of the Appeal Brief, this is apparent from at least the abstract of Brendel, which states that a load balancer "stores the SSL session ID along with a server assignment that identifies the server that generated the SSL session ID" and for subsequent requests from the same client "uses the SSL session ID to send the requests to the same server." It is further apparent from FIG. 7 and the associated text at column 9, lines 2-12, of Brendel, which makes it clear that the table stores session IDs with respective server identifiers, that is, for each session ID, the table stores a corresponding server identifier. This is exactly the problematic conventional situation that is addressed and solved by the present invention. Since Brendel explicitly teaches to use the problematic conventional approach identified by Appellants in the background portion of their specification, it clearly teaches away from the claimed invention, which is a novel approach that solves the problems of the conventional approach.

The Examiner further questions a citation by Appellants to teachings from column 15, lines 22-23. However, the Examiner mistakenly attributes this citation to Brendel, when in the Appeal

Brief the citation is clearly not to Brendel but to Choquier. See the Appeal Brief at page 6, lines 8-9, which cites column 15, lines 22-23, of Choquier. The Examiner in the final Office Action dated April 18, 2006, at page 4, section "a," makes reference to a "load management system utilizing a range of values assigned to each entity." Appellants point out that this reference relates to the use of "a randomization technique in selecting a server," as disclosed at column 15, lines 22-23, of Choquier. However, Brendel teaches to maintain SSL persistency by storing for each SSL session ID a server assignment that identifies the server that generated the SSL session ID, and directing subsequent requests from a given client to the server that previously generated a session ID for that client. Thus, Brendel cannot make use of the random server selection approach of Choquier, without loss of SSL persistency. By applying the random server selection of Choquier to Brendel, as proposed by the Examiner, Brendel becomes unworkable in that it can no longer guarantee that subsequent requests from a given client are sent to the server that previously generated a session ID for that client. Appellants therefore submit that one skilled in the art would not be motivated to apply a random server selection technique, such as that described in the relied-upon portions of Choquier, to a Brendel arrangement in which it is particularly important that server selection not be random but instead fully deterministic. Choquier therefore teaches away from the present invention and from combination with Brendel.

Point A.2

Appellants argue at page 6, third paragraph, of the Appeal Brief that the collective teachings of Brendel, Choquier and Gongwer fail to meet the limitation of claim 1 in which a load balancer is configured with information specifying a pre-assignment of different groups of session ID values to respective servers, with each of the servers being operative to assign session ID values from its associated one of the pre-assigned groups to sessions handled by that server. The Examiner relies primarily on the teachings in Choquier at column 15, lines 28-41. However, as Appellants noted above with reference to column 15, lines 22-23, of Choquier, the relied-upon teachings from Choquier relate to random server selection. The random server selection approach is shown in greater detail in FIG. 8 of Choquier, and it assigns ranges of integers to servers based on their CPU

processing power. A given request is directed to a particular one of the servers by generating a pseudo-random integer R between 1 and M, where M is the highest assigned integer, and then directing the request to the server that has R within its assigned integer range. It is important to note that the integer ranges assigned to the servers in Choquier have nothing whatsoever to do with session IDs of client messages. In fact, the assigned integer ranges bear no relation whatsoever to any particular parameter of a client message. Instead, the integer ranges are simply used to identify a particular server based on mapping of a random number to one of the assigned ranges. It is a random server selection technique which is apparently unable to maintain SSL persistency, and therefore entirely inconsistent with the Brendel approach that stores session IDs with respective server identifiers.

The relied-upon portions of Gongwer fail to supplement the fundamental deficiencies of the proposed combination of Brendel and Choquier. The Examiner argues that Gongwer teaches selection of a session identifier from a pool of unassigned session identifiers. This is nothing more than Appellants have already acknowledged as conventional in the background portion of their specification at page 1, lines 29-30. It would apparently not be appropriate for a server to assign session IDs to certain clients where those session IDs are already assigned to other clients. But the combination of this conventional session ID selection of Gongwer with Brendel still results in an arrangement in which session IDs are stored with respective server identifiers, and such an arrangement suffers from the excessive memory and processing problems previously described. Choquier fails to alter this situation, because its random server selection approach is inapplicable to arrangements like Brendel which are attempting to maintain SSL persistency.

Point A.3

The integer ranges used in the random server selection approach of Choquier are not ranges of values from which a server may assign session IDs as recited in claim 2. Brendel and Gongwer fail to disclose such ranges of values from which a server may assign session IDs. The integer ranges of Choquier have no relation whatsoever to session IDs, and the associated random server selection appears to be inconsistent with the desired maintenance of SSL persistency. In Choquier,

the pseudo-random number R is apparently re-generated for each incoming request, and thus server selection bears no relation to session ID. The collective teachings of Brendel, Choquier and Gongwer therefore fail to meet the limitation in question.

Point A.4

The Examiner appears to rely primarily on the teaching in column 15, line 4, of Brendel, which states that the server ID could be encoded in the SSL session ID. However, claim 3 calls for managing a table which lists for at least one of the servers, values of a subset of the bits of session IDs associated with that server. Simply encoding the server ID in the SSL session ID does not meet this limitation. In fact, Brendel notes that such an arrangement eliminates the need for a table altogether. See Brendel at column 15, lines 5-7. Appellants therefore respectfully submit that Brendel teaches away from the claimed arrangement. The collective teachings of Brendel, Choquier and Gongwer fail to meet the limitation in question.

Point A.5

The Examiner apparently argues that the random server selection technique of Choquier discloses a rule on session IDs that a server may assign to sessions. However, as indicated above, the integer ranges assigned to servers in Choquier have nothing whatsoever to do with session IDs, much less a rule indicating which session IDs that a server may assign to sessions. As Appellants indicated at page 8, second paragraph of the Appeal Brief, the relied-upon portions of Brendel are also deficient in this regard. The collective teachings of Brendel, Choquier and Gongwer therefore fail to meet the limitation in question.

Point A.6

The Examiner apparently argues that the integer ranges assigned to servers for purposes of random server selection in Choquier meet the limitation of claim 11. However, the limitation relates to assigning a same number of session IDs to each of the servers. The integer ranges in Choquier are not session IDs, and have nothing whatsoever to do with session IDs. As described above, the use of

the assigned integer ranges is incompatible with maintenance of SSL persistency, and contrary to the recited limitation. The collective teachings of Brendel, Choquier and Gongwer therefore fail to meet the limitation in question.

Point A.7

Again, the integer ranges of Choquier, relied upon by the Examiner, are not session IDs and have nothing whatsoever to do with session IDs. The associated random server selection is incompatible with a session ID approach that preserves SSL persistency. Brendel and Gongwer teach away from the limitation of claim 12 by teaching conventional assignment and processing of session IDs. The collective teachings of Brendel, Choquier and Gongwer therefore fail to meet the limitation in question.

For the reasons identified above and in their Appeal Brief, Appellants respectfully submit that claim 1 and the other independent claim 19, and their associated dependent claims, are allowable over the prior art of record.

Respectfully submitted,

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